NON-PUBLIC?: N
ACCESSION #: 8911210289
LICENSEE EVENT REPORT (LER)

FACILITY NAME: South Texas, Unit 2 PAGE: 1 OF 3

DOCKET NUMBER: 05000499

TITLE: Reactor Trip Due to a Dropped Control Rod
EVENT DATE: 10/13/89 LER #: 89-026-00 REPORT DATE: 11/13/89

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Charles Ayala TELEPHONE: (512) 972-8628
Supervising Licensing Engineer

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: AA COMPONENT: STC MANUFACTURER: W120
REPORTABLE NPRDS: No

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On October 13, 1989, Unit 2 was in Mode 1 at 100 percent power. At 1745 hours, a reactor trip occurred due to the detection of high neutron flux negative rate on two of four power range neutron monitoring channels. The plant was brought to a stable condition in Mode 3 with no unexpected post-trip transients. The cause of the event is believed to be an intermittent high resistance connection on a stationary gripper diode in the rod control system which caused rod F-8 in control bank A to drop. The diode has been replaced. The remaining stationary gripper diodes on both units will be inspected during the next scheduled maintenance outage on each unit.

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END OF ABSTRACT

DESCRIPTION OF EVENT:

On October 13, 1989, Unit 2 was in Mode 1 at 100 percent power. At 1745 hours, a reactor trip occurred from two of four power range neutron monitoring channels due to detected high neutron flux negative rate. The turbine tripped on the reactor trip and the feedwater isolation valves closed on low reactor coolant system average temperature. Auxiliary feedwater was initiated after the reactor trip from low steam generator water level as expected. Approximately 4 minutes following the reactor trip, the operators closed the main steam isolation valves to prevent excessive cooldown. No safety injection actuation occurred and the plant was stabilized in Mode 3. The NRC was notified pursuant to 10CFR50.72 at 2021 hours.

The sequence of events report and other computer alarm logs were examined to determine the cause of the negative rate trip. Due to computer scan frequency limitations, no conclusive evidence was found to confirm whether one or more control rods had dropped. The rod control system power supplies (two motor-generator sets) were inspected by operations personnel. Both were found running normally and supplying the required voltage with no indicated faults. The rod control system power cabinets were then inspected and no blown fuses or abnormal conditions were detected. The reactor trip breakers were reclosed and all nine rod banks were sequentially withdrawn to six steps (approximately 4 inches) and reinserted in an effort to isolate any dropped rods due to rod control system failure. All rods responded as indicated on the rod position indication (DRPI) system. Since an intermittent failure affecting one or more control rods was suspected, the rod control system power cabinets were inspected for loose connections. When no loose connections were found, the resistance of all stationary gripper coils was measured from the power cabinets. No abnormal readings were found. The power cabinet DC power supplies were tested. One of the backup power supplies was found inoperative and replaced, and was determined later to be unrelated to the reactor trip since the primary power supply was operative and did not lose its AC supply. A comprehensive test of the rod control system was performed to obtain DC current profiles of the stationary gripper, moveable gripper, and lift coils for each mechanism. No abnormal conditions were detected from the resulting data.

A recorder was installed to monitor stationary gripper circuits to isolate the intermittent failure in the event of another rod drop. At approximately 0609 hours on October 15, 1989, while withdrawing Control Bank A rods, Rod F-8 dropped from 21 steps (approximately 13 inches). All withdrawn rods were reinserted. Troubleshooting revealed an open

diode in the stationary gripper circuit for rod F-8. The diode was replaced and Mode 2 entered at 1853 hours. The reactor neutron flux was mapped at approximately 10 percent power to confirm the DRPI system indication (no rods at bottom).

CAUSE OF EVENT:

The cause of the reactor trip was high neutron flux negative rate detection on two of four power range neutron monitoring channels. The exact cause of the detected negative rate could not be conclusively determined, but has been attributed to Control Bank A, Rod F-8, dropping due to an intermittent high resistance connection in its stationary gripper circuit diode. The cause of the high resistance connection could not be determined.

ANALYSIS OF EVENT:

Reactor trip and Engineered Safety Features actuation are reportable pursuant to 10CFR50.73(a)(2)(iv). The reactor tripped as required and plant equipment operated as expected. No unexpected post-trip transients occurred and there was no safety injection actuation. There were no adverse radiological or safety consequences as a result of this event.

CORRECTIVE ACTION:

The following corrective actions are being taken as a result of this event:

1. The faulty diode has been replaced.

2. The stationary gripper circuit diodes in the rod control system will be inspected for similar conditions during the next scheduled outage on each unit.

ADDITIONAL INFORMATION:

There have been no previous events reported regarding reactor trips due to dropped control rods.

The part number on the diode described above is 1N1206AR and the diode was manufactured by Westinghouse.

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ATTACHMENT 1 TO 8911210289 PAGE 1 OF 2

The Light
company P. O. Box 1700 Houston, Texas 77001 (713) 228-9211
Houston Lighting & Power

November 13, 1989
ST-HL-AE- 3292
File No.: G26
10CFR50.73

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Unit 2
Docket No. STN 50-499
Licensee Event Report 89-026 Regarding a
Reactor Trip Due to a Dropped Control Rod

Pursuant to 10CFR50.73, Houston Lighting & Power (HL&P) submits the attached Licensee Event Report 89-026 regarding a reactor trip due to a dropped control rod. This event did not have any adverse impact on the health and safety of the public.

If you should have any questions on this matter, please contact Mr. C. A. Ayala at (512) 972-8628.

R. W. Chewning
Vice President
Nuclear Operations

RWC/BEM/eg

Attachment: LER 89-026, South Texas, Unit 2

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A Subsidiary of Houston Industries Incorporated

ATTACHMENT 1 TO 8911210289 PAGE 2 OF 2

Houston Lighting & Power Company

cc:

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Revised 10/30/89
NL.DIST

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